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1876

INTERMEDIATE STATEMENT
OF THE
AGRICULTURAL COLLEGE
OF
IOWA,
MADE FOR 1876.

BEING THE YEAR INTERMEDIAL BETWEEN THE BIENNIAL
SESSIONS OF THE LEGISLATURE.

AMES, IOWA :
AGRICULTURAL COLLEGE STEAM PRINT.
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*During 1876.

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CONDITIONS OF ADMISSION.

No student of either sex can be legally admitted under the age of sixteen. No student will be admitted for less than a term, and none will be permitted to leave before its close, except on account of ill health or other serious reasons not foreseen at the time of entering.

Applicants must be residents of the State and able to pass a satisfactory examination in Reading, Spelling, Writing, Arithmetic, Geography, and English Grammar. They are required to understand the simpler processes of Algebra.

At their late meeting the Trustees decided that a sub-Freshman class should be organized at the opening of the next College year, (March, 1877), and that such students as desired to prepare for the College courses should receive instruction in Grammar, Arithmetic, Physiology, and the elements of Algebra. This privilege is granted for the purpose of giving more thorough preparation for College classes. Such students will be furnished with rooms in the building if not needed for the College students.

Candidates may make direct application by letter to the President of the College. By law three are admitted from each county; but should any county fail to apply, the deficiency may be made up from other counties.

EXPENSES.

Students pay actual cost for board, fires, lights, laundry, damages to college property when caused by themselves, care, lighting, warming, and general repairs of the college building and furniture, and such other incidental expenses as specially belong to them as a body. Students pay nothing for tuition nor for the general expenses of the College. Damages to college property will be charged to the person damaging the same when known, but if its author is undiscovered it will be *assessed* upon the section where it occurs, or upon the whole school. Students supply themselves with pillows and other bedding, with towels, and with carpets if they desire them. They

supply themselves also with ticks, which can be filled with straw after their arrival. The rates of charges are as follows :

Board, per week.....	\$2.65
Fires and lights, per week.....	.47
Incidental expenses, per week.....	.25
Laundry, average per dozen, about.....	.60
Room rent, average per term.....	3.00

As the boarding department of the College is self sustaining, receiving no aid from the State, depending entirely upon receipts from students to pay expenses, there can be no free admission to its tables. Students or other persons bringing friends are required, therefore, to pay at the rate of twenty-five cents per meal for each such friend before admission to the dining hall.

The conduct of students in the dining hall, during meals, is under the supervision of one of the professors, and is required to be in harmony with the strictest propriety.

The provisions purchased for the boarding department are of the very best quality that can be procured in the market, the aim being to furnish well cooked, substantial and nutritious food.

Students not boarding in the building will, by order of the Board, be charged a Janitor's fee of \$5.00 per term.

DEPOSIT.

Accepted candidates will deposit fifteen dollars each, with the Treasurer, as a security for the payment of their bills, and have their names entered upon his books; after which they are considered members of the College, and are entitled to all its privileges.

MONTHLY SETTLEMENT.

Students will settle all bills for each month at the cashier's office, on the second Saturday of the month following, the original deposit being retained till final settlement. The necessity for prompt settlement is imperative, and any student who neglects this duty, except for reasons satisfactory to the President, may be dismissed by him for such neglect.

CARE OF MONEY AND VALUABLES.

Students may, if they desire, deposit money and other valuables with the Treasurer for safe keeping. While the College authorities will do all in their power to recover lost articles, and to prevent and punish theft, the College cannot be responsible for such losses or thefts from the persons or rooms of students.

SPECIMEN EXAMINATIONS.

Below are given specimen examinations. It will be understood that they are only *specimens*, and not the actual ones which will be given to the applicant. Seventy-five per cent. of the questions must be answered in order that the candidate be received.

GRAMMAR.

1. Name and define the parts of speech in the following sentence:

“Maud Muller on a summer's day
taked the meadows sweet with hay.”

2. Parse “had gone” and “came,” in the sentence “Mary had gone before her mother came.”

3. Analyze the following sentence:

“His house was known to all the vagrant train ;
He chid their wanderings, but relieved their pain ;
The long remembered beggar was his guest,
Whose beard, descending, swept his aged breast.”

ARITHMETIC.

1. Divide 320,000,421 by 320.

2. Get the greatest common divisor of 7,030, 1,900 and 7,410.

3. Reduce $\frac{\frac{5}{8} - \frac{1}{8}}{\frac{3}{4} \times \frac{1}{2}}$ to its simplest form.

4. Divide .00045 by .0000009.

5. Multiply 3,145 by .0004.

6. Divide 3 miles, 10 ft., 9 inches, by 10.

7. Get the bank discount on \$720.34 for 1 year and 27 days, at $9\frac{1}{2}$ per cent.

8. If ten horses eat 180 bushels of oats in 60 days, how long will 240 bushels last 30 horses?

9. Get the square root of 81,039 to three decimal places.

10. Get the cube root of 65 to three decimal places.

ALGEBRA.

1. From $3a^2bc - 21ab^2d$ subtract $5a^2bc - 24ab^2c$.

2. Divide $-3a^{-4}$ by a^2 .

3. Divide $a^6 - b^6$ by $a - b$.

4. Resolve $a^{16}-b^{16}$ into five factors.
5. Find the greatest common divisor of $3x^4+4x^3-6x^2-12x-5$ and $3x^5-6x^4-18x^3+12x^2+39x+18$.

GEOGRAPHY.

1. Bound New York, Alabama, Michigan, and Texas, and name their capitals and chief cities.
2. On a voyage by water from Duluth to New York City, through what waters would you pass, near what States, and what important cities would you pass?
3. How would you go by water from Chicago to St. Petersburg?
4. Name the important seas, countries and cities of Europe and Asia.
5. Name the most important rivers of South America, and give their positions.
6. On a voyage from Portland to Vancouver's Island, through what waters would you pass; what capes and large cities would you go near?

SPELLING.

Intelligent,	Courageous,	Retina,
Panegyric,	Efficient,	Traveler,
Evanescence,	Embrace,	Literally,
Actuate,	Whipped,	Satirical,
Especially,	Until,	Dactyl,
Occurred,	Separate,	Operate,
Courtesy,	Panoply,	Ambulance.

GOVERNMENT AND CODE.

The system of government under which the institution is conducted, has grown out of its organization and the purposes it is designed to accomplish. The addition of manual labor to the various courses, makes perfect regularity and promptness indispensable on the part of every student. Young men and women are earnestly advised not to apply for admission to the college, unless they can cheerfully submit to wholesome regulations.

The following well considered rules, if obeyed, give the institution the highest efficiency, and secure for the student the largest possible return for time and expense.

SYNOPSIS OF THE COLLEGE CODE.

STUDY, RECITATION AND LABOR.

1. The hours from seven to ten o'clock on week-day evenings, and from 7:15 A. M. to 12 M., and 1:30 P. M. to 4:45 P. M., of all week-days except Saturday, are devoted to study, recitation and labor.

2. Students shall attend promptly all exercises of classes to which they belong. The recitation for an excused absence from class shall be made up within two weeks from such absence.

3. Examinations shall be conducted in writing, when possible, upon questions proposed by the instructors of the various classes, and no special examinations will be granted except in cases of sickness or unavoidable absence.

4. No student shall graduate from this college who has not passed an examination and obtained a standing of *three* (four being perfect) on each of the studies of the course in which he proposes to graduate. Studies which are pursued for a part of a term, or a part of the time during any term, shall be counted proportionately to such part.

5. All students who labor are detailed by the President, and work an average of two hours and one-half each day, for five days in the week.

COLLEGE SOCIETIES.

The President or Faculty must in all cases be consulted by the students, before organizing any literary, scientific, or other society. The members of such duly organized society may meet for improvement, during the study hours of such evenings as may be designated by the President or Faculty. Their meetings may, if necessary, hold till 10 P. M., and in such cases the retiring bell shall be rung at 10:30 P. M.; but in no case shall attendance upon the meeting of any society be construed to excuse students from a strict observance of study hours after adjournment.

THE SABBATH, AND WORSHIP.

1. Students shall duly observe the Sabbath by maintaining a proper degree of quiet and order in and about the college.
2. Students will assemble in the Chapel once in each day for prayers, and on every Sabbath afternoon for public worship.

INSPECTION.

On each week-day morning, at inspection hour, students shall have their rooms open and ready for inspection, and upon Saturday morning, at least one occupant, or some representative, shall be present at such inspection.

EXCUSES.

1. When students have been absent from any exercise, they shall in person, as soon as possible, present their reasons for such absence, to the President.

OBSERVANCE OF BY-LAWS.

2. Students shall strictly observe the by-laws pertaining to any of the departments of the College.

PROHIBITORY LAWS.

1. Students may not leave the vicinity of the College building at any time without permission from the President. General permission to be absent on Saturday, is given by the President.
2. Loud talking, whistling, scuffling, gathering in halls and staircases, and boisterous and noisy conduct, are *at all times* forbidden.
3. During study hours, when not engaged in work or recitations, students may not leave their rooms except for unavoidable reasons approved by the presiding officer of the section.

4. At ten o'clock P. M., lights shall be extinguished, and from this time to the rising bell no student may be out of his room, except for unavoidable reasons, nor shall he in any way disturb his neighbors.

5. Students may not abstract or remove any article, whether clothing, food, furniture, tools, fruit, or any other property belonging to the College.

6. Card playing, and other games of chance, cooking, and the use of tobacco and intoxicating beverages, are strictly forbidden in any of the College buildings.

STUDENT GOVERNMENT.

1. At the beginning of each term, there shall be elected from each section, one Councilman, one Captain, and one Lieutenant, and such election shall be valid upon approval by the President, *provided*, that no student who is a lawbreaker shall be eligible to such offices.

2. It shall be the duty of each Captain, or, in the Captain's absence, of the Lieutenant, to preserve order in his section, according to law, and to report all violations of law to the Councilman of his section, who shall present the same to the Council at its next meeting. The Captains and Lieutenants will meet once each week with the President of the College, for informal report as to the condition of the government in their sections, and to consult as to the best means of securing harmony and efficiency of action.

3. The Council shall organize by choosing a president and a secretary from its own members, whose duties shall be the ordinary duties of such officers in deliberative assemblies. The Council shall hold regular meetings each week for the purpose of trying such offenses, and only such, as are reported.

4. In all trials, the President of the Council shall preside as Judge, and he shall appoint one member thereof to conduct the prosecution. The accused shall be present during his trial. He may have a member of the Council appointed as his attorney, and he shall have the privilege of cross-questioning witnesses in person or by his attorney.

5. In any trial, the testimony of the officer reporting the offense, that of all other competent witnesses, and admissions made by the accused, shall be received in evidence.

6. The verdict, and the number of demerits, shall each be

given by vote, in which the President shall have only the casting vote, and no member shall be debarred from voting on account of giving evidence in the case.

7. It shall be the duty of the Council to report its proceedings to the Faculty, weekly, for approval.

8. When a student officer has been reported to the Council for any misdemeanor, the Council shall, without trial, refer the case to the Faculty.

9. Whenever it shall appear that the members of any section are not able to maintain good order, and the disorder shall not seem curable by other and milder means, the President of the College may vacate the rooms in such section.

10. When the demerits of any student reach five in number, he will be warned by the Secretary of the Faculty; when his demerits reach ten, the Secretary will again warn him, and advise his friends of such action, with the reasons therefor; for fifteen demerits he shall be requested to withdraw from the College.

11. The Faculty reserve the right to try or rehear all cases of disorder, disobedience or immorality, when circumstances demand it.

12. The Faculty reserve the right to expunge the demerit marks of any student upon his subsequent blameless conduct.

MANUAL LABOR

The following rules, regulating manual labor, were established by the Trustees, at their Spring meeting, 1876, and have been in successful operation during the last college year.

1. The manual labor required by law, of students in the College, is divided into two kinds, viz: unproductive labor, which shall be compensated by the payment of wages; and productive labor, which shall be compensated by the instruction given and the skill acquired.

2. Unproductive labor shall comprise all the operations in the workshop, garden, dining room, upon the farm, and elsewhere, in which the work done accrues to the benefit of the College and not to the student; productive labor shall embrace all those operations in the workshop, museum, laboratory, dining room, upon the farm, and elsewhere, in which the sole purpose of the student is the acquisition of skill and practice.

3. Members of the Freshman class shall engage in unproductive labor $12\frac{1}{2}$ hours each week of the term, at the rate of from 4 to 9 cents per hour.

4. The members of the higher classes shall engage in productive labor in the presence and under the instruction of the Professor in charge, and the amount and time of such labor shall be determined by the Industrial Committee.

5. Special details shall be given, on application, to the most faithful and meritorious students of the higher classes, at the rate of pay for unproductive labor.

6. Students of the higher classes may, at their option, engage in unproductive labor, for not less than one month, at the same rate and under the same conditions as the Freshman class.

7. Students capable of acting efficiently as foremen, on appointment to such duty by the Industrial Committee, may receive increased pay, not exceeding 14 cents per hour.

8. Students, whose promptness, punctuality, efficiency and good conduct shall be found of a high character, may be recommended by the Professor in charge, at the close of each month, to the Industrial Committee for pay, during the past month, at the rate of ten cents per hour.

9. The Industrial Committee shall be composed of the superintendents of the industrial departments, viz: the Professor of Practical Agriculture, the Superintendent of the farm, the Professor of Horticulture and Forestry, the Professor of Mechanics, the Steward, the Preceptress, and the Superintendent of the dining room and kitchen. The President of the College shall be chairman. This committee shall have power to try all offenses of students while engaged in labor, and to vote demerit marks for the same, the student having the privilege of appeal to the Judiciary Committee.

COURSES OF STUDY.

AGRICULTURAL COURSE.

FRESHMAN YEAR.

First Term.

Algebra.
Book-keeping.
Analysis of English Language.
Rhetoric.
Free-hand Drawing.
Elocution; English Composition.
French or Latin. (*Optional to proficient in Analysis*).

Second Term.

Geometry.
Physiology.
Elements of Criticism.
Agriculture.
Free-hand Drawing.
Elocution; English Composition.
French or Latin. (*Optional*).

SOPHOMORE YEAR.

First Term.

Plane Trigonometry and Surveying.
General Chemistry.
Botany.
Physics.

Second Term.

Inorganic Chemistry: Qualitative Analysis.
Botany.
Zoology; Entomology.
Agriculture: History, races, breeding and management of domestic animals.
Physics.

JUNIOR YEAR.

First Term.

Organic Chemistry, and Quantitative Analysis.
Botany.
Physics.
Horticulture: Propagation of plants, seedlings, grapes and fruits; fruit culture; forestry.

Second Term.

Agriculture: Farm engineering and architecture; draining; road making; water supply; plans for farm buildings.
Agricultural Chemistry: Analysis of soils, etc.
Comparative Anatomy and Physiology.
Physics: Meteorology.
Elocution: Reading of Shakspeare.
Landscape Gardening.
Addresses in Chapel.

SENIOR YEAR.

First Term.

Psychology.
Geology.
Agricultural Chemistry.
Veterinary Science.
Addresses in Chapel.

Second Term.

Political Economy.
Constitutional History and Law.
Science of Language.
Veterinary Science and Practice.
Laboratory work: Food analysis.

COURSE IN MECHANICAL ENGINEERING.

FRESHMAN YEAR.

Identical with the course in Agriculture.

SOPHOMORE YEAR.

First Term.

Identical with the course in
Agriculture.

Second Term.

Analytical Geometry.
Descriptive Geometry, *Church*.
Inorganic Chemistry: Qualitative Analysis.
Physics.

JUNIOR YEAR.

First Term.

Differential and Integral Calculus, *Buckingham*.
Shades, Shadows and Perspective, *Church*.
Physics.
Theoretical Mechanics, *Peck*.

Second Term.

Exercises in Mechanical Drawing, *Warren*.
Applied Mechanics: Strength of Materials, *Wood*.
Physics: Meteorology.
French.
Addresses in Chapel.

SENIOR YEAR.

First Term.

Psychology.
Geology. (*Optional*)
Principles of Mechanism.
Machine Drawing.
French.
Addresses in Chapel.

Second Term.

Political Economy.
Constitutional History and Law.
Theory of Motors, *Rankine*.
Designs, Details, and Estimates for Machinery.

COURSE IN CIVIL ENGINEERING.

For the Freshman, Sophomore, and Junior Years, the course is identical with the course in Mechanical Engineering.

SENIOR YEAR.

First Term.

Psychology.
 Geology. (*Optional*).
 Civil Engineering: Materials and structures.
 Field practice: Surveys for railways and other works, with maps and plans in detail for their construction.
 French.
 Addresses in Chapel.

Second Term.

Political Economy.
 Constitutional History and Law.
 Civil Engineering: Combined structures.
 Designs and detailed drawings for Bridges and other Civil Constructions.

COURSE IN GENERAL SCIENCE FOR LADIES.

For the Freshman year the course is identical with the course in Agriculture.

SOPHOMORE YEAR.

First Term.

General Chemistry.
 Botany.
 English Literature.
 Physics.
 Plane Trigonometry. (*Optional*).

Second Term.

Inorganic Chemistry: Qualitative Analysis.
 Botany.
 Zoology: Entomology.
 Physics.

JUNIOR YEAR.

First Term.

Organic Chemistry.
 Botany.
 Domestic Economy.
 Physics.

Second Term.

Comparative Anatomy and Physiology.
 Physics: Meteorology.
 French.
 Domestic Economy.
 Domestic Chemistry.
 Landscape Gardening.
 Elocution: Reading Shakspeare.
 Addresses in Chapel.

SENIOR YEAR.

First Term.

Psychology.
 Geology.
 French.
 Addresses in Chapel.

Second Term.

Political Economy.
 Constitutional History and Law
 Science of Language.

NORMAL COURSE.

The course of lectures for the Normal Department includes the following subjects: Organization and Government of Schools; Methods of Teaching; Primary Instruction; Natural order of studies corresponding to the order of evolution of the intellectual powers; Mental Philosophy as applied to the work of the school room; Rigid review of the common branches.

The above course of lectures will be given during the last month of the College year.

SPECIAL COURSES.

For the purpose of enabling students of the Junior and Senior classes to attain a high degree of proficiency in any special branch of industrial science or art, the Faculty permit a choice of some single study and the omission of others as given below. It is understood that the student will devote double the usual time to the study so chosen.

The special student in **CHEMISTRY** may omit, in Junior year, first term, Botany or Physics; second term, Comparative Anatomy or Physics: Senior year, first term, Geology and Veterinary Science; second term, Veterinary Science and Practice.

The special student in **BOTANY** may omit, in Junior year, first term, Chemistry or Physics; second term, Chemistry, Physics, or Comparative Anatomy: Senior year, first term, Geology or Veterinary Science; second term, Veterinary Science and Practice.

The special student in **PHYSICS** may omit, in Junior year, first term, Chemistry or Botany; second term, Chemistry or Comparative Anatomy: Senior year, first term, Geology, or Veterinary Science and Agricultural Chemistry; second term, Veterinary Science and Practice.

The special student in **AGRICULTURE** may omit, in Junior year, first term, Horticulture and Physics; second term, Physics

The special student in **HORTICULTURE** may omit, in Junior year, first term, Physics; second term, Agriculture and Physics.

The special student in **GEOLOGY** may omit, in Senior year, first term, Veterinary Science and Agricultural Chemistry; second term, Veterinary Science and Practice.

The special student in **VETERINARY SCIENCE** may omit, in Junior year, first term, Botany or Chemistry; second term, Agricultural Chemistry or Physics.

The special student in **MECHANICS** may omit, in Junior year, first term, Physics; second term, Physics: Senior year, first term, Geology and French.

The special student in **CIVIL ENGINEERING** may omit, in Senior year, first term, Geology or French.

TIME TABLE FOR 1877.

FIRST TERM.

	7-15-8	8-9	9-10	10-11	11-12	1-1.30	1.30-2.15	2.15-3.3	3.45-4.45	7-10	
FRESHMAN CLASS.	Farm Work.				Book-Keep- ing.*	Language.	Algebra by divisions.	{ Elocution.+ Eng. Comp. Milit'ry Drill. F. H. Draw'g		Study.	
SOPHOMORE CLASS.		Trig'ry. Surv'ing.	Botany.*		Chemistry.* Physics.†	Practice in the Field or Chemical Laboratory by Divisions.					Study.
JUNIOR AGRIC'S.		Organic Chemistry with Practice in the Laboratory.			Botany. •	Horticulture.	Practice in the Field or Laboratory.				Study.
JUNIOR MECH'N'S.		Mechanics. Calculus.			S. S. & Pers.	Practice in the Workshop.					Study.
SENIOR AGRIC'S.		Farm Work.			Geology.				Vet. Science.* Ag'l Chem.†	Study.	
SENIOR MECH'N'S.	Engineering.	French.*			Geology.	Practice in the Field, Workshop and Drafting Room.					Study.

SECOND TERM.

FRESHMAN CLASS.	Farm Work.			Physiology.* Agriculture.†	Elements of Criticism.	Geometry by divisions.	{ Elocution.† Eng. Comp. Milit'y Drill. F. H. Draw'g	Study.
SOPHOMORE AGRIC.	Chemistry.†	Zoology.	Stock Breed- ing.*	Physics.* Botany.†	Practice in the Field or Chemical Laboratory by Divisions.†			Study.
SOPH. MECH'S.	Chemistry.†			Physics.* Desc. Geom.†	Practice in the Workshop or Chemical Laboratory by Divisions.†			Study.
JUNIOR AGRIC'S.	Laboratory Practice in Agricultural Chemistry.†	Physics.*	Comp. Anat. and Phys.	F. E. & Arch* Ag. Chem.†	Landscape Gardening.*	Practice in the Field.		Study.
JUNIOR MECH'S.	Mechanics.	Physics.*	Plating and Drafting.	French.	Practice in the Workshop and Drafting Room by divisions.			Study.
SENIOR AGRIC'S.	Farm Work		Science of Language.	Polit. Ec'y. Con'l H. & L.	Veterinary Science.*	Food Analyses.†		Study.
SENIOR MECH'S.	Designing.	Engineer- ing.		Polit. Ec'y. Con'l H. & L.	Practice in the Drafting Room.			Study.

* Tri-weekly. On Mondays, Wednesdays, and Fridays.

† Semi-weekly. On Tuesdays and Thursdays.

‡ The Freshman class is divided into four divisions, A, B, C, D. Whereof: On Monday A and B have Free-hand Drawing, C Elocution, D English Composition.

On Tuesday A has Elocution, B English Composition, C and D Free-hand Drawing.

On Wednesdays the whole class has Military Drill.

On Thursdays A and B have Free-hand Drawing, C English Composition, D Elocution.

On Friday A has English Composition, B Elocution, C and D Free-hand Drawing.

On Tuesdays the Sophomores have Military Drill from 10 to 11.

On Thursdays the Juniors “ “ “ “ 9 to 10.

On Mondays the Seniors “ “ “ “ 9 to 10.

§ The Sophomore class is so arranged that during the Spring Term each student spends two afternoons per week in the Chemical Laboratory, and one afternoon per week in the field Surveying, throughout the term.

¶ The Sophomore class is so arranged during the Fall Term that each student spends three afternoons per week in the Chemical Laboratory.

In place of Trigonometry and Surveying the ladies have English Literature at the same hour.

Other special studies in the Ladies' course will have the time for their recitation arranged when the classes are formed.

The hours for lessons and practice in Music are arranged privately by the teacher with each pupil.

DEPARTMENTS OF INSTRUCTION.

AGRICULTURE AND VETERINARY SCIENCE.

The aim of this department is to add skill in the various actual operations of the farm, to a complete understanding of those operations, and a thorough knowledge of the principles which underlie them, to impart a thoroughly scientific knowledge of the entiology, pathology and treatment of the various diseases to which our domestic animals are subject.

The preliminary studies are pursued in the departments of Mathematics, Chemistry, Botany, Zoology, and Physiology, and upon the perfect mastery of these, depends largely the student's success in the later and more comprehensive study of these subjects.

The theoretical study of Agriculture proper, occupies two years and is divided at present between President Welch, Professors Stalker and Bessey and the Professor of Horticulture.

Instruction in Agricultural Chemistry and analysis of soils, is given by the Professor of Chemistry during the Junior and Senior years. Instruction in the management of the domestic animals, rotation of crops, use of manures, raising of crops etc. is given by Professor Stalker. Lectures on the formation of soils and kindred topics, are given by the Professor of Geology.

FRESHMAN YEAR.

During the second term of this year, Professor Stalker gives two lectures per week on the history of Agriculture and the most approved method of farming in our own State.

SOPHOMORE YEAR.

The history, races, breeding and management of domestic animals. President Welch lectures upon cattle during the second term, and Professor Stalker upon horses and swine.

JUNIOR YEAR.

First Term.—Propagation of plants, seedlings, grapes, and fruits, orcharding, fruit culture and forestry.

The Professor of Horticulture gives lectures upon all these topics.

Second Term.—Farm engineering and architecture, embracing drawing, road making, water supply, farm machinery, plans for farm houses, etc. Weekly practice is given the class in surveying and leveling.

SENIOR YEAR.

First Term.—Professor Stalker gives three lectures per week on Veterinary Anatomy, including osteology, myology, digestive apparatus, the circulatory and nervous systems, etc. All these lectures are fully illustrated by skeletons and carefully prepared specimens of the various organs.

Second Term.—Professor Stalker gives three lectures per week on pathology, the cause and treatment of diseases of domestic animals and the action and uses of medicines in veterinary practice. The class will have the advantage of a clinic once each week.

The above lectures are given either in class-room, field or stable as the subject requires. The practical operations in agriculture are fully illustrated in the management of the large farm attached to the College upon which a course of mixed husbandry is pursued under the superintendence of Professor Stalker. In addition, the orchards, nurseries, vineyards, and small fruit gardens are under the immediate charge of the Professor of Horticulture. This gentleman employs students to do the work in his department and trains them in all the operations connected therewith. The College Farm has great variety of soil, necessitating a varied culture. For its cultivation it has all the more approved farm machinery, and for the purpose of illustration it is stocked with many of the more important breeds of cattle, sheep, swine and fowls.

HORTICULTURE AND FORESTRY.

This department embraces the instruction and practice in culinary horticulture, floriculture, pomology, and forestry, and comprises class-room exercises and field lectures in the presence of the objects to be studied, together with daily practice in all the manipulations of the work of the gardens, nurseries, orchards, for-

estry plantations, flower borders, hedges and ornamental grounds.

The instruction is imparted principally by lectures, and the topics are considered in the following order: First, general horticulture, embracing physics of the soil, plant development and nutrition, and external influences upon plants; second, technical horticulture,* embracing descriptions and studies of implements, processes, and plants and their products.

The teaching is supplemented, as far as may be, by practice on all the operations and details of the work which is always in progress while the College is in session; and principles and facts are fixed in the mind by the use of visible objects of study always accessible to the student.

The means of practical illustration at the command of the department are as follows:

The vegetable gardens, planted in all descriptions of culinary crops.

The nurseries, planted with such stock as will best illustrate our work.

The orchards, planted with seventy varieties of apples, fourteen varieties of pears, five varieties of cherries, and three varieties of plums.

The small fruit plantations, planted with the hardiest and best varieties of grapes, raspberries, currants, strawberries, etc.

The forestry plantations, planted with such trees as are best adapted to climate and location.

The ornamental grounds, planted with one hundred and fifteen varieties of trees and shrubs.

The flower gardens, upon which a large variety of hardy flowering shrubs and plants are grown.

In addition, collections are in hand, or being made, as follows:

A set of *fac-simile* casts of the fruits of Iowa, native and introduced.

A set of the native woods of Iowa, with their leaves and fruits.

A set of sections of the cultivated woods of Iowa, to show the rate of growth under culture.

A set of insects injurious to objects of culture in this department.

A set of insects and animals beneficial in horticulture, by being predatory upon destructive insects.

A set of abnormal and of diseased growths.

CHEMISTRY.

FACILITIES.

For an earnest student, one desirous of obtaining a practical and available knowledge of Chemistry, this College certainly affords superior advantages. The laboratories are well supplied with the advances of recent years, giving to each student the benefits of a table, gas, water, and chemical apparatus for his exclusive use. There are one hundred of these tables, made of black walnut, at which all the experiments of agricultural and inorganic chemistry may be performed, also benches covered with tiles, where organic work may be done. No expense has been spared to fit these laboratories up and add such new apparatus as the advances in Chemistry demand. Particular advantages are offered to those students who wish to make chemistry a special study, also for our own graduates and those of other colleges to take an advanced course.

SOPHOMORE YEAR.

First Term.—General Inorganic Chemistry. Recitation three times and Laboratory practice twice each week. The topics discussed in the text books and lectures, are illustrated by experiments in the Laboratory, which the student is required to perform.

Second Term.—General Inorganic Chemistry and Qualitative Analysis. The recitations comprise a careful review of the previous term's work. The laboratory practice (three afternoons in the week) embraces a thorough course in Qualitative Analysis. Both the simple and complex substances, which the student is systematically taught to analyze, well fit him for future usefulness in this important branch of the science.

JUNIOR YEAR.

First Term.—Quantitative Analysis. Recitations three times a week. Laboratory practice daily. With good facilities the students are taught to analyze coal, water, manures, fertilizers etc. The ladies' course embraces the detection of adulterations in food, value of soap, analysis of water, etc., thus bringing Chemistry into every day life and particularly into household affairs.

Second Term.—Quantitative Analysis. Organic Chemistry.

Recitations and laboratory practice each twice a week. Organic Chemistry is taught by text book and lectures. The student now takes up food analyses, (the fat and muscle producers), and begins to apply his chemistry directly to the *farm* and its *products*. Different kinds of soil and their relations to plants, now are studied and fit the student for the studies in the Senior year. The ladies' course includes the study of Domestic Chemistry, taught once a week by lectures, affording instruction in such subjects as the chemistry of cooking, in all its branches, ventilation, diet in sick room, remedies for poisons and cases of emergency, etc.

SENIOR YEAR.

First Term.—Agricultural Chimestry, taught by lectures twice a week. The student now studies the chemistry of the soil; the enriching of it when deficient in any element, by manuring; the chemistry of the plant and the influence of the weather on it, and the use to the animal in fattening and producing muscle.

Second Term.—Quantitative Analysis of Food. In this term the student works in conjunction with experiments tried on the farm; finds by analysis how much of the food is assimilated by the animal, how much wasted; how crops vary in their chemical constituents when grown on different soils and climates, and thus deduce which crops are best fitted for our own soil.

PHYSICS.

Physics is studied through the Sophomore and Junior years. During the first term, the Sophomores study the mechanics of solids, liquids and gases. The subjects of Light and Sound are considered during the second term, while Heat occupies the Junior class for the first half of the year. Electricity, magnetism and Meteorology complete the course during the second term of the Junior year. A physical cabinet, which has cost about \$5,000, furnishes excellent facilities for illustrating the principles of Physics, and the new Physical Laboratory, with its well ordered lecture room, affords all the conveniences for making this study profitable.

SPECIAL COURSE IN PHYSICS.

This course occupies the Senior year. During the first term the student is taught the methods of physical investigation.

Jevons' *Principles of Science* is read, with laboratory practice twice each week. Astronomy is taught during the second term, and the student is required to solve practical problems in Physics. Laboratory practice twice each week.

DEPARTMENT OF BIOLOGY.

Instruction in Biology extends through two and a half College years, beginning with the second term of the Freshman year. It includes Human Physiology, Botany, General Zoology, Entomology and Comparative Anatomy.

HUMAN PHYSIOLOGY.

The Freshmen of all the courses are required to attend three recitations or lectures per week on Human Physiology, during the second term of the college year. Each student familiarizes himself with the form and position of the bones of the human body by a direct examination of the skeleton. The compound microscope is used frequently for showing the more important objects which are too minute for the naked eye. The object of this study in this place in the College curriculum, is to give to the student, as early as possible, such a knowledge of the structure of his own body as will enable him to take reasonable care of it during the trying work of his College course. The text-book used is Hutchinson's "Treatise on Physiology and Hygiene," and every student is recommended to provide himself also with Mivart's "Lessons in Elementary Anatomy," as a book of reference.

BOTANY.

During the first term of the Sophomore year, students of all the courses have three recitations or lectures, and three hours of laboratory practice each week in Elementary Botany. The general structure and the external conformation of plants are taken up by the student, and he is further required to familiarize himself with these, by making careful analyses of at least twenty plants, recording his observations and submitting them to the professor for examination. He also prepares and classifies fifty herbarium specimens, which are submitted at the end of the term, for examination and correction. For this work each student sup-

plies himself with a good hand lens, dissecting needles, forceps, a note book, etc. The text-book used is Gray's "School and Field Book of Botany."

In the second term of the Sophomore year, two hours each week are spent in lectures or recitations on Systematic Botany. The laboratory practice for this term consists in the dissection and classification of Grasses, Composites and some other difficult orders of plants. The leaf-forms of our native and cultivated trees are studied and drawn, and the differences between species are accurately pointed out. Fifty additional herbarium specimens are prepared, as in the first term, and added to each student's collection. The text-book used is Gray's "Manual of the Botany of the Northern United States." Books of Reference, Torrey and Gray's "Flora of N. A.," LeMaout and Decaisne's "General System of Botany," DeCandolle's "Prodromus."

In the Junior year, during the first term, students in Botany have five recitations or lectures and three hours of laboratory practice each week. This constitutes the advanced course, and includes (1) a careful study of the deeper questions in Vegetable Anatomy and Physiology, (2) Economic Botany, (3) the outlines of Cryptogamic Botany, which are taken up in the order given, the term being about equally divided among the three topics. The laboratory practice consists in examinations made by means of the compound microscope. The Botanical Laboratory possesses seven good instruments, and other needful apparatus, and with these the student prepares his own specimens and makes his investigations. Text-books and books of reference, Gray's "Structural and Systematic Botany," Sachs's "Text Book of Botany," Johnson's "How Crops Grow," Smith's "Domestic Botany," Berkley's "Introduction to Cryptogamic Botany," Cooke's "Handbook of British Fungi."

The means of illustration throughout the whole course in Botany are: (1), The college herbarium; (2), a collection of billets of various kinds of woods; (3), a collection of grasses; (4), a collection of cones of evergreens; (5), a set of diagrams and charts; (6), seven compound microscopes; (7), alcoholic and dry material for examination in Botanical Laboratory; (8), students also have access to the collections of mosses, lichens and fungi, belonging to the professor in charge.

GENERAL ZOOLOGY.

The course in general Zoology occupies a portion of the last term of the Sophomore year. The method of instruction is a combination of the recitation system with lectures and museum study: lessons from a text book are assigned daily, and these the students are required to carefully prepare and recite; lectures are given from time to time upon the more important topics which are not sufficiently dwelt upon in the text book ; and throughout the term the student spends three hours each week in the study of the specimens in the museum. The text books used are Orton's "Comparative Zoology," and Jordan's "Manual of the Vertebrates of the Northern United States." Dr. Coues' "Key to N. A. Birds," Van Der Hoeven's "Hand-book of Zoology," and Carpenter's Zoology are recommended for reference.

ECONOMIC ENTOMOLOGY.

During a portion of the fall term of the Sophomore year, Entomology takes the place of General Zoology. After obtaining from the text book a general knowledge of the structure and classification of insects, the student attends a course of lectures, in which all the more prominently harmful insects are taken up and discussed. In each case the life-history of the insect is dwelt upon, as of the greatest importance in enabling the farmer or gardener to suggest remedies ; the various checks and remedies are taken up and discussed, and the student is invited to freely give his opinion as to their value and practicability. Text books and books of reference, Packard's "Guide to the Study of Insects," Riley's "Reports upon the Insects of Missouri," Harris' "Insects Injurious to Vegetation."

The College possesses a valuable cabinet of insects, which is accessible to the students of this department.

COMPARATIVE ANATOMY.

This study is designed to familiarize the student with the general anatomy, physiology and development of all the great groups of animals. The method of instruction is by means of daily lectures supplemented by an examination of books of reference. Three hours of laboratory practice each week, enable the student to make dissections of animals, and to examine many of the minuter parts by means of the microscope. Books of reference, Carpenter's "Principles of Comparative Physiology,"

Packard's "Life Histories of Animals," Clark's "Mind in Nature," Foster & Balfour's "Elements of Embryology," Carpenter's "Mental Physiology," Darwin's "Origin of Species," "The Variation of Plants and Animals under Domestication," Hæckel's "History of Creation."

GEOLOGY.

This study is pursued by the Senior class during the first term. The subject of Mineralogy is first studied by means of lectures and specimens from the Museum. Dana's text-book of Geology is then completed, and afterwards, the class spends from two to three weeks studying the Geology of Iowa. A course of lectures is then given upon Geology as related to Astronomy, and on various other important subjects, such as: Iowa coal mines, petroleum, salt and gypsum, origin of the prairie, and kindred subjects. As aids to the study, the Museum is furnished with a full series of Wards geological casts, giving examples of the fossils peculiar to every stage of the world's history. The Museum also has a valuable collection of the more important minerals and rocks, and additions are being made thereto every year. Occasional excursions are made by this class, accompanied by the teacher, to places in the vicinity which will afford the best opportunity for the study of practical Geology.

DOMESTIC ECONOMY.

Domestic Economy is taught to the young ladies of the Junior class by lectures on the following topics: House furnishing, ventilation, water supply, cooking, sewing, management of help, care of the sick, training of children, dress, etc.

MATHEMATICS.

There are two courses in mathematics, a lower and a higher. The lower course embraces:

Freshman Year.—Algebra and Geometry.—*Loomis.*

Sophomore Year.— { Trigonometry.—*Church.*
 { Surveying.—*Gillespie.*

The higher course embraces:

Sophomore Year.— { Analytical Geometry.—*Chauvenet.*
 { Descriptive Geometry.—*Church.*

Junior Year.— { Differential and Integral Calculus.
 { Descriptive Geometry, Shades, Shadows, and Perspective.—*Church.*

The lower course is designed for all the students, and the higher course especially for those who pursue the studies in Mechanical or Civil Engineering.

Instruction is given by text-books, daily recitation, and lectures. The subject is illustrated, and the theory applied by the construction and solution of numerous problems. Students in surveying are required to practice daily, by divisions, in the field during the latter part of the spring term. They use the instruments, keep the notes, plat the surveys, and obtain a thorough knowledge of all practical operations.

BOOK-KEEPING.

The instruction in book-keeping is given in connection with the lessons and exercises in Bryant & Stratton's larger text-book. Each student opens and keeps a full set of books in double entry ; writes business letters, contracts, receipts, bank checks, accounts of sales, bills of lading, and other business and legal papers ; rules, and keeps the various auxiliary books useful in business ; files and preserves vouchers, and in general, does what he would be called upon to do in actual business. In addition, tri-weekly recitations are made upon the principles involved and their applications.

CIVIL ENGINEERING.

It is the purpose of this department to afford to the student a plain and practical, but thorough course in the application of the mathematical and physical sciences to the profession of Civil Engineering. The first step in this course is taken in the Sophomore year, in the study and practice of Land Surveying. The instruction in the class room is supplemented by work in the field, where the student becomes acquainted with all the manual portions of the business and acquires proficiency in the use of the chain, compass, transit, and other instruments. The data taken in the field are kept as in actual work, and from them the areas are calculated and the fields plotted.

In the Junior year the study becomes more strictly technical. The student now studies the various methods of laying out railway curves, putting in switches and side-tracks, and setting slope-stakes. Nearly all of the important problems investigated in the class room are taken into the field and staked out

upon the ground. Data are taken in the field for problems in earth-work, both excavations and embankments, whose contents are calculated. In the latter part of the year the general principles of the construction of roads, railways, canals, water-works, &c. are studied, with problems upon the flow of fluids and the general principles of hydraulics. During this year also, a practice survey of a portion of a line of railway is undertaken, and the engineering of the work carried as far as is possible without the actual construction. The line is run, the curves put in, the profile taken, the grades established, and it is then cross-sectioned and left ready for the contractor. The notes of this work are kept exactly as in actual practice, and from them a profile and plan in detail are drawn, including also the more important topographical features of the adjoining lands.

During the Senior year the student devotes himself to the study of the higher problems of engineering, such as the stability and strength of arches and suspension bridges, the construction of bridge and roof trusses and girders, and the laying of foundations. A portion of the last term of this year is devoted to the designing of structures and calculations of their strength, with detailed drawings of the same, in a word the "office work" of a constructing engineer.

MECHANICS.

During the past year the students in the wood-working department have made several articles of furniture, a first-class cabinet work-bench, and prepared much of the material used in wainscoting and repairing the college building. The students in the machine shop have constructed from working drawings a four horse-power engine, which is now set up in the Printing Department and is used to run the printing presses. They have made many tools and attachments to the machines in the shop, such as taps, drill chucks, planer chucks, standard face plates, etc.

With the shops as now equipped a limited number of students can receive instruction in workshop practice, equal to that received in any workshop, with this difference: here he enters into the work with special reference to instruction, and not for the purpose of enriching the profession, as is the case while serving an apprenticeship.

The Department of Mechanics is intended to prepare students for the profession of mechanical engineering, and is pursued during the Junior and Senior years by those who complete the course.

It is intended to supply a class of men who are not merely practical nor wholly theoretical; but who, guided by correct principles, shall be able to invent, design, construct, or manage machinery in any of the industrial pursuits.

To this end the plan of instruction is two-fold. First, *theoretical*; second, *practical*; hence, practice in the workshop is required of all who complete the course. The theoretical instruction is imparted by means of recitations from text-books and lectures, illustrated by models and plates.

The practical instruction will consist of *projects*, in which the student shall be required to produce some machine of new design, or one which shall be of practical utility to the College or to those who may avail themselves of our advantages for manufacturing. For this purpose, the student will have the use of the machinery and tools in the workshop, under the direction of the teacher; the instruction being according to the most approved methods of machine-shop practice. This will teach the student the manner in which the mechanical engineer carries his design into execution, and to so proportion and dispose of the parts of a machine as to secure the greatest economy in construction and durability. The student will also take indicator diagrams from the engine in the workshop, and determine from them the power developed by the steam while working with different degrees of expansion.

COURSE OF STUDY.

Analytical Mechanics.—Representation and measurement of forces; composition and resolution of forces; center of gravity; elementary machines; motion in straight lines; uniform and varied motion; curvilinear motion; centrifugal force; moment of inertia; laws of impact and center of percussion; work done in overcoming resistance; accumulation of work; work done by motors.

Resistance of Materials.—Laws and coefficients of elasticity; work of elongation and time of oscillation, set, viscosity; modulus of strength, safe limits, tension and compression; strength of columns; theory of flexures and rupture, neutral axis; shear-

ing stress, flexure of beams and columns; tensions; shocks; crystallization; experiments and practical formula.

Cinematics and Principles of Mechanism.—Relative motions of points in any system of connected lines or pieces; motion considered independent of force; velocity ratio; investigation of the motion of the different elementary parts of a machine; correct working gear; teeth; gearing chains; escapements; link work.

Machine Drawing.—Drawings of original design; drawings completely finished in water colors, and in line drawing, and detailed drawings for the workshop; such as are made in the best manufactories of the country; prime movers; wind-wheels, water-wheels, steam and hot air engines.

The course in the workshop is so arranged as to give the student a thorough drill in the use of all tools for working wood and iron; and in the management of wood and iron working machinery.

GENERAL DESCRIPTION OF WORKSHOP.

The wood-working shop is a two-story building, thirty by fifty feet. It contains a fifteen horse-power Harris Corliss engine; a boiler with Stilwell heater; eighty feet of 2 inch turned shafting, with the most improved iron hangers and pulleys. It also contains a Fay pony planer; a Fay gig saw; a Fay sash mortiser, and a circular saw; six work-benches, with six full sets of bench tools. The engine has a Richard's indicator fitted to it for the purpose of taking diagrams.

The machine shop is in the basement of the new laboratory, and is connected with the wood-working shop by means of a wire rope transmission. It contains a line of shafting 62 ft. long, which is fitted with the best self-oiling hangers; a 20 in. by 12 ft. Fitchburg lathe; a 16 in. by 8 ft. Washburn lathe; a Washburn hand lathe; a 22 in. by 5 ft. Fitchburg planer; an 18 in. Fitchburg drill; also a full set of fluted reamers, flat reamers, twist drills, taps, dies, etc.

ENGLISH LANGUAGE AND LITERATURE.

FRESHMAN YEAR.—ALL COURSES.

First Term.—Analysis of the English sentence (Welch's), and Rhetoric.

Second Term.—Elements of Criticism.—(Kames').

SOPHOMORE YEAR.—LADIES' COURSE.

This year embraces the course in English Literature, proper.

First Term.—English Literature, embracing the early history of the English Language, and a critical study of the biography, literary labors, style, etc., of the representative authors of the marked epochs of English History, special stress being laid on the political and religious influences at work in the times in which they wrote.

SENIOR YEAR.—COURSE FOR THE AGRICULTURISTS AND LADIES.

Second Term.—Science of Language. Prof. W. D. Whitney's work, entitled, "Language and the study of Language," is the text-book used. In this study the student is made familiar with the underlying principles of linguistic growth and decay, and the processes of phonetic change, the genetic and morphological classifications of all the great families of tongues on the face of the earth, and the conclusions reached by the great masters in comparative philology on the origin of language, its relation to thought, and its bearing on the question of the unity of the human race.

Two plays of Shakspeare are critically studied with the view more particularly of fixing the import of the "Shakspearian phraseology," and exercising the students' powers on obscure and highly wrought passages. These plays are afterwards made the material for elocutionary drill.

FRENCH.

French is studied during one year of the course by the ladies, and by the gentlemen in the mechanical course. Fasquelle's "French Course" is studied thoroughly, and then one term is almost entirely occupied in making translations from Knapp's French Reader.

PSYCHOLOGY.

The study of psychology occupies one hour daily through the first term of the Senior year. It is pursued first by text-book and recitations, afterwards by listening to familiar lectures, and finally by the preparation and reading of essays on the most important topics which the science presents. The purpose sought in the study is not to acquire the habit of idly speculat-

ing on questions which lie beyond the limits of human knowledge, but rather to gain a thorough insight into human nature, and the springs of human conduct. All intercourse with men calls such knowledge into exercise.

POLITICAL ECONOMY.

Political economy is the science of exchange. It presents and expounds the laws of business in all their complexity. Industrial education, especially at the present day, is incomplete without a familiarity with the principles that underlie the commercial transactions whether small or great. In nearly all the vocations, a lack of such knowledge is almost a fatal deficiency. Political economy is studied during the senior term, by means of recitations, discussions and essays.

COMPOSITION.

The Freshman class give, during the entire year, one hour a week to careful drill, in the class room, in English composition ; essays and written discussions are prepared and brought to class where they are criticised and corrected.

ELOCUTION.

The Freshmen have regular drill in Elocution once a week during the whole year. Pieces are prepared in the class in composition and then are practiced and spoken in the elocution class.

MUSIC.

Music is not, by law, a regular study in the College curriculum. Opportunities are given, however, to such as desire it, to take lessons upon the organ or piano, and also in vocal culture. The rates of charge are as follows :

Lessons on piano, (one each week).....\$10 per term.

Lessons in vocal culture, (two each week)..... 12 per term.

Lessons on organ, (one each week), with practice

every day..... 10 per term.

Students pay for tuning instruments twenty-five cents per month. Sheet music extra.

MILITARY TACTICS AND ENGINEERING.

This department, established pursuant to act of Congress, will be conducted in strict conformity with United States Army Regulations, the course embodying the following branches of study:

Military Engineering.—Field and Permanent Fortifications; military bridges; mining; topographical and free-hand drawing.

Military Tactics.—Infantry, cavalry, artillery, bayonet and broad-sword exercise.

Gunnery and Ordnance.—Theory of Projectiles, Siege, Artillery and Mortar practice.

Military Law.—Practice of Courts-Martial; United States Army Regulations.

Practical instruction will be given in some one of the different arms of the service three times a week.

The following branches will be taught through the successive Collegiate years :

Freshman.—Schools of the Soldier and Company.

Sophomore.—Practical instruction in the schools of the Soldier and Company; Field Artillery, Bayonet and Sword exercise.

Junior.—Schools of the Soldier and Company; Bayonet and Sword exercise.

Senior.—Military Engineering; School of the Battalion; Ordnance and Gunnery; Cavalry Tactics; Military Law.

Text Books.—The text books used are Upton's "Infantry Tactics," McClellan's "Bayonet Exercise," Mahan's "Military Engineering," Smith's "Field Artillery." Works of reference are the following : Scott's "Military Dictionary," Duparco's "Military Art and United States Army Regulations."

Recitations and Drill.—Each class will recite or drill at least once a week in the following order, viz:

Freshmen, Wednesdays from 3:45 to 4:45 P. M.

Sophomores, Tuesdays from 10 to 11 A. M.

Juniors, Thursdays from 9 to 10 A. M.

Seniors, Mondays, from 9 to 10 A. M.

The above classes will be organized into a College Battalion, the officers for the same being appointed in the following manner: Staff and Field officers from the Junior and Senior classes and others from the Freshmen and Sophomore classes according to merit. The names of such as may be deemed eligible by the commandant of the Battalion and President of the College, will

be forwarded through the Adjutant General's office to the Governor of the State for commission.

By the late action of the Board of Trustees of the College, all students taking the military course must be uniformed. It will therefore be necessary that those who intend entering the course in the spring of 1877, be furnished with uniform this winter. The uniform required will be one regulation hat, one blue blouse, one pair blue pants. The course is optional.

The whole cost will not exceed \$20.00. The material will be of good quality, and suitable for ordinary wear on the College Farm.

Send measurement and the money to Gen. Geddes, Deputy Treasurer, as soon as possible.

THE MUSEUM.

The College has a valuable and growing museum. Rooms have been especially provided for the purpose, in the main College building. The departments of Geology, Zoology, Entomology and Anatomy, are well provided for by well preserved specimens for illustration. Among the prominent and interesting features of the museum may be mentioned a full set of the Ward series of Geological casts. These casts are restored forms of extinct animals. They are said by prominent naturalists, to be superior for purposes of illustration, to the original specimens from which they were copied, and represent the principal extinct animals which have existed from the earliest times to the present day. A valuable and well preserved set of Iowa serpents has been collected. A set of the birds of the State woods, shells, the more important minerals and rocks, fossils, seeds, specimens of the plants of the West, mammals, etc., are other interesting features of the museum.

THE NEW LABORATORY.

This building was completed last year. In size it is seventy feet long, by forty in breadth, and three stories and a half high, including the basement. This building, together with the old laboratory which joins it, affords commodious apartments for the purpose for which it was designed. The basement of the new portion contains a boiler for heating the entire building, and valuable machinery for working in iron; power being transmitted from the work-shop by means of an endless wire rope. The old laboratory and the first floor of the new, are occupied

solely by the department of Chemistry. The rooms are furnished with tables, gas, water, and all conveniences needed in a first class chemical laboratory. The second floor is occupied by the department of Physics. An excellent lecture room, well furnished, occupies the south half of the floor, and rooms for the physical cabinet and private work the remainder. The upper floor is lighted by skylights from the roof, and furnishes an excellent drawing-room for the Mechanical department, and a room to be used as an observatory.

These conveniences furnish the departments of Physics and Chemistry with very superior facilities for giving instruction to advanced students. Opportunity is offered for the student to study in the best possible way, by actually performing the experiments for himself. Both Physics and Chemistry can be taught to as good advantage as in any of the Western Colleges.

A good experiment, either in Physics or Chemistry, is never forgotten. The student who actually handles the apparatus and performs the experiments in chemistry for himself gets there from a knowledge which cannot be obtained from books. The beautiful lecture-room experiments upon light, heat and electricity appeal to the senses as well as to the intellectual faculties and awaken an interest in study which can be stirred in no other way. The new education teaches the hand as well as the head. It teaches things and not books. The Agricultural College is in full sympathy with the new education, and opens wide the doors of its new laboratory for the use of all lovers of science with practice.

LIBRARY.

Early in the history of the College an appropriation of several thousand dollars was made for the commencement of a library. Every year an addition of several hundred volumes is made to the original nucleus, so that the whole number of volumes is now about five thousand. The library is designed to be a working one. The books purchased are such as will most effectively aid the teachers and students in the special work of the different departments of the College. Full sets of the most prominent encyclopedias have been purchased; such as the *Encyclopedia Britannica*, the *American* and *Chambers'*, besides numerous cyclopedias of dates and biography. The library is divided into alcoves and well arranged and fitted with tables, shelving, etc.

In one alcove may be found the works of the modern standard poets, historians and writers of fiction; such as Scott, Macaulay, Dickens and Froude. Another alcove contains the standard works upon Physics, Metaphysics, Geology and of the British Essayists. On a little further may be found the *American Journals of Science* for the past thirty years; the prominent works on Agriculture, Horticulture and Applied Science.

The naturalist can find the works of Audubon, with beautiful plates of the birds and quadrupeds of America painted to nature. The library is in receipt constantly of many of the prominent daily and weekly newspapers of the State, and also of many of the monthly magazines and periodicals of the United States and Europe. It is open eight hours each day for the use of students and teachers.

MEANS OF ILLUSTRATION.

IN THE MUSEUM—

- A collection of the principal minerals.
- Geological specimens from the Iowa survey.
- A set of models of the larger fossils.
- Collections of mammals, birds and reptiles.
- Seeds and products of agricultural plants.
- Collections of skulls and skeletons.
- A cabinet of insects.

IN THE HERBARIUM—

- A collection of the plants of Iowa.
- A collection of Lake Superior plants.
- Miscellaneous collections from the Eastern States.
- Blocks of wood of trees and shrubs.
- A set of the more important grasses.
- Diagrams and charts.
- Professor Bessey's collections of Mosses and Fungi.

IN THE PHYSICAL CABINET—

- A Holtz Electrical Machine.
- A Stereopticon, with photographic slides.
- A twenty inch Ruhmkorf coil, made by Elliot, of London.
- A Ritchie Atwood Machine.
- A general collection of apparatus, including Melloni's apparatus, Geissler's tubes, Hero's fountain, etc.

IN THE CHEMICAL LABORATORY—

- Furnaces, sand-baths, hoods, balances, filter pumps and other apparatus for general and analytical chemistry.

IN THE MATHEMATICAL ROOM—

- Surveying and leveling instruments.
- Draughting instruments, and tables.
- Plates of machinery.

IN THE WORKSHOP—

A Corliss engine.
 Lathes for wood and iron.
 Scroll machine.
 Dovetailing machine.
 Mortising machine.
 Planer.
 Hand tools for wood and iron.

ON THE FARM—

The farm itself of eight hundred acres of prairie and timber land, with the barns and stables thereon.
 Herds of Short-horn, Devon, Ayshire, and Jersey cattle.
 Spanish Merino, Cotswold, and Southdown sheep.
 Berkshire and Poland-China swine.
 A vegetable garden.
 A small-fruit garden.
 A young apple orchard.
 Plantations of forest trees.

IN THE ARMORY—

Forty stand Breech-Loading Rifles.
 Forty stand Enfield Rifles.
 Forty Light Sabres.
 A 12 pounder Bronze Cannon.
 Drums and Fifes.

CALENDAR FOR 1877.

First term begins.....Wednesday, March 7th.
First term examinations.....July 10th, 11th, 12th.
First term closes.....July 12th.
Second term begins.....July 18th.
Second term examinations.....November 12th, 13th, 14th.
Address before the Literary Societies. Monday evening, Nov. 12th.
Address before the Trustees.....Tuesday evening, Nov. 13th.
Commencement.....Wednesday afternoon, November 14th.
Term closes....November 14th.





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